9-1993

Lithuanian Agriculture and the World Market: Policy Options and Implications and Modeling Agricultural Markets for Policy Trade Analysis in Lithuania

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Abstract
The two related papers in this report were prepared for two conferences in Estonia in May 1993. The first paper (Saku) discusses alternative policy directions for Lithuanian agriculture and provides a qualitative assessment of these options. The second paper (Tartu) uses a simulation model for Lithuanian agricultural markets to analyze the impacts of three policy scenarios. The reference or baseline scenario assumes that real prices will increase at a specified rate. This forms the basis for comparison of two other scenarios. One assumes that domestic prices reach world market parity prices by 1995, allowing only for a quality discount of 15 percent for meat products. The other scenario assumes the extreme self-sufficiency case, where all imports and exports are zero and prices are solved for equilibrium levels.

Keywords
Agriulture, Policy, International Trade

Disciplines
Agricultural and Resource Economics | Agriculture | Economic Policy | International Economics

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Modeling Agricultural Markets for Policy and Trade Analysis in Lithuania

Natalija Kazlauskiene and William H. Meyers

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These papers were presented at two conferences in Estonia. The first was presented at the IV Finnish-Baltic Seminar, "Agricultural Development Problems and Possibilities in Baltic Countries in the Future," Saku, Estonia, May 31-June 3, 1993. The second was delivered at the 33rd European Association of Agricultural Economics Seminar, "New Trends in East-West Cooperation in Food Production and Marketing," Tartu, Estonia, May 20-30, 1993.

Production and distribution of the Baltic Report series is funded by the Midwest Agribusiness Trade Research and Information Center (MATRIC), Iowa State University. MATRIC is supported by the Cooperative State Research Service, U.S. Department of Agriculture, under Agreement No. 92-34285-7145. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the U.S. Department of Agriculture.

CONTENTS

FIGURE

TABLES

INTRODUCTION

The two related papers in this report were prepared for two conferences in Estonia in May 1993. The first paper (Saku) discusses alternative policy directions for Lithuanian agriculture and provides a qualitative assessment of these options. The second paper (Tartu) uses a simulation model for Lithuanian agricultural markets to analyze the impacts of three policy scenarios. The reference or baseline scenario assumes that real prices will increase at a specified rate. This forms the basis for comparison of two other scenarios. One assumes that domestic prices reach world market parity prices by 1995, allowing only for a quality discount of 15 percent for meat products. The other scenario assumes the extreme self-sufficiency case, where all imports and exports are zero and prices are solved for equilibrium levels.

All of these results are very sensitive to the macroeconomic assumptions for the future, especially for inflation and exchange rates. Since the papers were written, there has been a major change in the nominal and real exchange rates for Lithuania as a consequence of the introduction of the national currency, litas, on June 15, 1993, at the exchange rate of 100 talonas/litas and 4.35 litas/U.S.$. Shortly after it was introduced, the litas appreciated substantially. In contrast to our assumption in this paper that the Lithuanian currency would appreciate by 20 percent in real terms by 1995, it actually appreciated by more than 50 percent between 1992 and 1993. This change substantially reduces the world market parity prices measured in domestic currency. Our earlier estimate of inflation for 1993 appears to be consistent with developments so far this year, and projected declines in inflation for 1994 and 1995 still look reasonable.

To show the impact of the recent exchange rate changes and assumptions for the future on the world market parity prices, the free trade price table in real terms is recalculated and presented as Table B.1. This table uses an exchange rate for 1993 that is near the peak of the litas value so far this year. Then the real exchange rate is held nearly constant in 1994 and 1995. For the readers who prefer to see these figures in nominal domestic prices, Table B.2 provides the same calculations in nominal terms. Note that the litas are equal to 100 talonas, so for consistency prices in 1993 to 1995 are expressed in talonas equivalents of litas prices.

In the original papers, the 1992 Lithuanian prices of all products included inthe tables,

except butter and refined sugar, were below estimated 1993 world market parity prices and many of them were far below. However, the appreciation of the domestic currency after June 1993 reduced the calculated world market parity prices by about 55 percent. Now all the 1992 prices, except grains and beef, are above estimated 1993 world parity prices (Table B.1) and some are substantially higher. The implication is that in a free market scenario, domestic prices would be quite a bit lower than what was estimated in the Tartu paper and all but grains and sugar beets would be lower in real terms than they were in May 1993.

LITHUANIAN AGRICULTURE AND THE WORLD MARKET: POLICY OPTIONS AND IMPLICATIONS

This is an important time for Lithuania to establish a policy framework that can guide private and government decision makers in the food and agriculture sector. As long as future policy directions remain uncertain, it is difficult for decision makers to make consistent and well-informed short-run and long-run choices. As farm and processing enterprises are in the process of restructuring, the current and prospective policy environment will have an effect on decisions that are made. For example, if a highly protective policy were adopted now and firms adjusted their organization and behavior to this policy, there would be another difficult adjustment if the protection were removed later.

Commodity market and trade policy options for Lithuania must be viewed in the context of the changing world policy and market environment. For example, the European Community (EC) has reformed its Common Agricultural Policy (CAP) and there is still some hope that the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) negotiations will result in an agreement that will influence the policy directions of Lithuania's neighbors in the European Free Trade Agreement (EFTA) and the European Community as well as many other GATT members. These changes could have important implications for Lithuanian food and agricultural products.

The purpose of this paper is to take a broad look at commodity market and trade policy options that are open to Lithuania. There is a wide range of options including open market (free trade) policies, joining the Common Agricultural Policy (CAP) of the European Community, or pursuing a self-reliance policy oriented to the domestic market. By reviewing the options in this continuum, we hope to bracket the realistic range of policy options.

Current Price Levels and Comparisons

Although Lithuania has undertaken a broad price liberalization over the past two years, most domestic producer prices are still well below prices in the United States, which are close to world market prices for many commodities and much lower than those in Germany and Finland (Table 1.1). Such comparisons are subject to much uncertainty because of differences in quality of products and somewhat different time periods, but some general tendencies can still be derived from

Table 1.1. Producer price comparison for main agricultural commodities in selected countries

	Lithuania		Latvia		Estonia	Poland	Hungary	U.S.A.	Germany	Finland	World
Products	Nov. 92	Mar. 93	Nov. 92	Mar. 93	1992	Dec. 92	1992	1992[a]	1992[a]	1992	1992
	Nominal Prices (U.S. $ per metric ton)										
Wheat	64.0	49.0	110.5	151.8	130.1	113.9	82.8	105.8	212.0	420.9	166.0
Barley	56.0	42.6	111.8	132.0	81.0	113.9	72.8	98.3	193.4	299.5	n.a.
Potatoes	72.0	n.a.	71.9	118.8	122.4	n.a.	152.2	145.5	157.7	n.a.	n.a.
Beef (l. weight)	132.0	425.9	152.9	287.8	286.9	593.0	806.3	1571.9	3819.9	5696.7	2018.0
Pork (l. weight)	560.0	638.8	531.2	746.5	344.3	890.8	980.3	998.7	1932.3	3093.8	1189.0
Poultry (l. weight)											
Milk	220.0	340.7	274.1	357.1	306.0	n.a.	773.3	762.8	1036.2	n.a.	1175.0
Eggs (1000 units)	66.0	70.3	67.1	89.8	68.9	126.6	191.1	297.6	370.6	602.8	n.a.
	28.8		34.7	33.0	n.a.	n.a.	53.9	34.3	94.1	226.7	n.a.
	Relative Prices (wheat = 1)										
Wheat	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Barley	0.88	0.87	1.01	0.87	0.62	1.00	0.88	0.93	0.91	0.71	n.a.
Potatoes	1.13	n.a.	0.65	0.78	0.94	n.a.	1.84	1.38	0.74	n.a.	n.a.
Beef (l. weight)	2.06	8.70	1.38	1.90	2.21	5.21	9.74	14.85	18.02	13.54	12.16
Pork (l. weight)	8.75	13.04	4.81	4.92	2.65	7.82	11.85	9.44	9.11	7.35	7.16
Poultry (l.weight)											
Milk	3.44	6.96	2.48	2.35	2.35	n.a.	9.34	7.21	4.89	n.a.	7.08
Eggs (1000 units)	1.03	1.43	0.61	0.59	0.53	1.11	2.31	2.81	1.75	1.43	n.a.
	0.45	0.00	0.31	0.22	n.a.	n.a.	0.65	0.32	0.44	0.54	n.a.

[a]August for USA and first quarter for Germany.

NOTES: The exchange rate in November was 250 talonas for $1 in Vilnius, Lithuania; 170 LAR (Latvian ruble) in Riga, Latvia; 81.6 Forint for $1 in 1992 in Hungary. In the first quarter of 1992 the exchange rate was 0.79202 ECU for $1. The exchange rate for March 1993 was 469.62 talonas per $1 in Lithuania, 151.5 LAR in Latvia, and 13.07 EEK in Estonia. The exchange rate for Zloty was 15800 per $1 in Poland. The exchange rate for Finland was 5.275 FIM per $1.

SOURCES: Lithuanian Ministry of Agriculture; Latvian State Institute of Agrarian Economics; Hungarian Department of Statistics; Agricultural Statistics Board 1992; Eurostat 1992a,b; Finnish Agricultural Economics Research Institute 1992; Polish Department of Statistics 1992; FAPRI 1992.

these figures. Comparisons with Estonia, Latvia, Poland, and Hungary are informative in that Estonia, Latvia, and Poland are neighboring countries going through similar reforms, while Hungary and Poland are post-communist states that began the transformation process before the Baltic states. These comparisons indicate that Lithuanian grain prices are also lower than in any of the neighboring states and Hungary. Prices of meat and dairy products are well below those in Poland and Hungary. Beef prices in Lithuania are higher than those in Latvia and Estonia, pork prices are between those of Latvia and Estonia, while poultry and milk prices are somewhat similar across the three states, although both are highest in Latvia.

Comparisons of relative prices are a way of avoiding the question of appropriate exchange rates, while evaluating the allocative efficiency among commodities within the agricultural sector. The Lithuanian barley price relative to wheat (Table 1.1) has been similar to that in the United States, Germany, and Hungary. Until the surge in livestock prices in early 1993, Lithuania had relative prices of beef, poultry and milk that were very unfavorable to the producers of these commodities. The pork price relative to wheat was similar to that in the United States, Germany, and Finland. In March 1993, the relative price of poultry is similar to that in the United States, while beef is still below the ratios in the United States, Germany, and Finland. The relative price of pork is similar to that in Hungary but higher than in the other countries listed in the table.

Price Prospects with Open Markets

To provide a general perspective on what domestic prices of selected commodities may be with open markets, data for 1991 to 1995 are used to calculate export parity prices and import parity (border prices) and implied internal prices for Lithuania (Table 1.2).

The method for calculating world market parity prices for the domestic market is illustrated in Figure 1.1. For imported goods (grains and sugar), the border price is calculated by adding transport and handling costs from the port where the world price is observed. It is converted to the domestic currency with the prevailing exchange rate. Then the equivalent farm price (price of farm produce paid by processors) is calculated by adding the average domestic transport and handling costs from the border to the point where average farm price is measured. For raw cane sugar, we added the domestic handling costs to get a price paid by the plant and calculated the equivalent sugar beet price by using the processing conversion rate. For refined sugar, we added domestic handling costs to the wholesale and retail levels to get an equivalent retail price.

Table 1.2. Free trade prices for Lithuania compared with actual domestic and projected prices in real 1991 U.S. dollars or talonas per metric ton

	1991	1992	1993[a]	1994	1995
Real Exchange Rate	110	25.2	25	22.5	20
CPI Lithuania	1	12.342	31.546	44.985	56.681
CPI U.S.	1	1.030	1.061	1.094	1.133
Exchange Rate (tl/U.S.$)	110	301.9	743.4	925.4	1,000.4
Inflation Lithuania	376.2	1,134.2	155.6	42.6	26.0
Inflation U.S.	4.2	3.0	3.0	3.1	3.6
Wheat			(U.S. $ per metric ton)		
Importer					
World Price, Rot.	159	166	157	171	188
Real World Price	159.0	161.2	148.0	156.3	165.9
Handling	12.5	12.5	12.5	12.5	12.5
Border Price	171.5	173.7	160.5	168.8	178.4
			(talonas per metric ton)		
Border Price	18,865	4,375	4,012	3,799	3,568
Domestic Handling	1887	438	401	380	357
Farm Price (world)	20,752	4,813	4,413	4,179	3,925
Farm Price (actual)	1000	1,645			
Corn			(U.S. $ per metric ton)		
Importer					
World Price, Rot.	120	103	110	116	123
Real World Price	120.0	100.0	103.7	106.1	108.5
Handling	10.0	10.0	10.0	10.0	10.0
Border Price	130.0	110.0	113.7	116.1	118.5
			(talonas per metric ton)		
Border Price	14,300	2,771	2,842	2,611	2,371
Domestic Handling	1,430	277	284	261	237
Farm Price (world)	15,730	3,049	3,126	2,872	2,608
Barley			(U.S. $ per metric ton)		
Importer					
World Price, Rot.	122	120	119	119	127
Real World Price	122.0	116.5	112.2	108.8	112.1
Handling	12.5	12.5	12.5	12.5	12.5
Border Price	134.5	129.0	124.7	121.3	124.6
			(talonas per metric ton)		
Border Price	14,795	3,250	3,117	729	2,492
Domestic Handling	1,480	325	312	273	249
Farm Price (world)	16,275	3,575	3,428	3,002	2,741
Farm Price (actual)	900	1,783			

Table 1.2. continued

	1991	1992	1993	1994	1995
Beef			(U.S. $ per metric ton)		
Exporter					
World Price, N. Eur.	1,990	2,018	1,987	1,912	1,853
Real World Price	1,990.0	1,959.2	1,872.9	1,748.1	1,635.2
Handling	25.0	25.0	25.0	25.0	25.0
Border Price	1,965.0	1,934.2	1,847.9	1,723.1	1,610.2
			(talonas per metric ton)		
Border Price	216,150	48,733	46,198	38,769	32,205
Domestic Handling	54,038	12,183	11,550	9,692	8,051
Wholesale Price	162,113	36,550	34,649	29,077	24,154
Retail Margin	24,317	5,482	5,197	4,361	3,623
Retail Price (world)	186,429	42,032	39,846	33,438	27,777
Retail Price (actual)	18,660	16,975			
Pork			(U.S. $ per metric ton)		
Exporter					
World Price, N. Eur.	1,370	1,189	1,124	1,264	1,426
Real World Price	1,370.0	1,154.4	1,059.5	1,155.6	1,258.4
Handling	35.0	35.0	35.0	35.0	35.0
Border Price	1,335.0	1,119.4	1,024.5	1,120.6	1,223.4
			(talonas per metric ton)		
Border Price	146,850	28,203	25,612	25,214	24,468
Domestic Handling	4,406	846	768	756	734
Wholesale Price	142,445	27,356	24,844	24,457	23,734
Retail Margin	21,367	4,103	3,727	3,669	3,560
Retail Price (world)	163,811	31,460	28,570	28,126	27,295
Retail Price (actual)	18,230	25,572			
Chicken			(U. S. $ per metric ton)		
Exporter					
World Price	1,162	1,175	1,169	1,215	1,229
Real World Price	1,162.0	1,140.8	1,101.9	1,110.8	1,084.6
Handling	30.0	30.0	30.0	30.0	30.0
Border Price	1,132.0	1,110.8	1,071.9	1,080.8	1,054.6
			(talonas per metric ton)		
Border Price	124,520	27,986	26,797	24,318	21,091
Domestic Handling	3,736	840	804	730	633
Wholesale Price	120,784	27,146	25,993	23,589	20,459
Retail Margin	18,118	4,072	3,899	3,538	3,069
Retail Price (world)	138,902	31,218	29,892	27,127	23,528
Retail Price (actual)	19,190	18,191			

Table 1.2. continued

	1991	1992	1993	1994	1995
Butter			(U.S. $ per metric ton)		
Exporter					
World Price	1,409	1,501	1,536	1,564	1,589
Real World Price	1,409.0	1,457.3	1,447.8	1,429.9	1,402.3
Handling	75.0	75.0	75.0	75.0	75.0
Border Price	1,334.0	1,382.3	1,372.8	1,354.9	1,327.3
			(talonas per metric ton)		
Border Price	146,740	34,827	34,321	30,485	26,545
Domestic Handling	36,685	8,707	8,580	7,621	6,636
Wholesale Price	110,055	26,120	25,741	22,864	19,909
Retail Margin	14,307	3,396	3,346	2,972	2,588
Retail Price (world)	124,362	29,516	29,087	25,836	22,497
Milk Farm Price (actual)	800	1,650			
Marketing Margin	18,230	35,065			
Retail Price (actual)	19,030	36,715			
Skim Milk Powder			(U.S. $ per metric ton)		
Exporter					
World Price	1,376	1,681	1,988	1,970	1,971
RealWorld Price	1,376.0	1,632.0	1,873.9	1,801.1	1,739.4
Handling	350.0	350.0	350.0	350.0	350.0
Border Price	1,026	1,282.0	1,523.9	1,451.1	1,389.4
			(talonas per metric ton)		
Border Price	112,860	32,301	38,907	32,649	27,788
Domestic Handling	28,215	8,075	9,524	8,162	6,947
Wholesale Price (world)	84,645	24,226	28,573	24,487	20,841
Milk Farm Price (actual)	800	1,650			
Processing Margin	7,600	15,678			
Wholesale Price (actual)	8,400	17,328			
Cheddar Cheese			(U.S. $ per metric ton)		
Exporter					
World Price	1,733	2,007	1,934	1,538	1,623
Real World Price	1,733.0	1,948.5	1,823.0	1,406.1	1,432.3
Handling	100.0	100.0	100.0	100.0	100.0
Border Price	1,633.0	1,848.5	1,723.0	1,306.1	1,332.3
			(talonas per metric ton)		
Border Price	179,630	46,574	43,075	29,388	26,645
Domestic Handling	44,908	11,644	10,769	7,347	6,661
Wholesale Price (world)	134,723	34,931	32,306	22,041	19,984
Retail Margin	17,514	4,541	4,200	2,865	2,598
Retail Price (world)	152,236	39,472	36,506	24,906	22,582
Milk Farm Price (actual)	800	1,650			
Marketing Margin	21,648	24,878			
Retail Price (actual)	22,448	26,528			

Table 1.2. continued

	1991	1992	1993	1994	1995
Refined Sugar			(U.S. $ per metric ton)		
Importer					
World Price	273	276	283	303	350
Real World Price	273.0	268.0	266.8	277.0	308.9
Handling	15.0	15.0	15.0	15.0	15.0
Border Price	288.0	283.0	281.8	292.0	323.9
			(talonas per metric ton)		
Border Price	31,680	7.129	7.044	6,570	6,477
Domestic Handling	4,435	998	986	920	907
Wholesale Price (world)	36,115	8,127	8,030	7,490	7,384
Retail Margi	7,223	1,625	1,606	1,498	1,477
Retail Price (world)	43,338	9,753	9,636	8,988	8,861
Retail Price (actual)	7,286	12,792	13,277	12,992	12,677
Raw Cane Sugar			(U.S. $ per metric ton)		
Importer					
World Price	198	200	210	210	244
Real World Price	198.0	194.2	197.9	192.0	215.3
Handling	15.0	15.0	15.0	15.0	15.0
Border Price	213.0	209.2	212.9	207.0	230.3
			(talonas per metric ton)		
Border Price	23,430	5,270	5,324	4,657	14,607
Domestic Handling	3,280	738	745	652	645
Price at Plant (world)	26,710	6,008	6,069	5,309	5,251
Raw Beet Sugar[b]					
Beet Equiv. Price (actual)	2,872	646	653	571	565
Beet FarmPrice (actual)	350	645	664	684	704

Notes: World prices are linked to FAPRI projections, except for sugar, which is linked to World Bank projections. Domestic prices are in rubles per metric ton for 1991 and in talonas per metric ton since October 1992. Since June 1993, talonas was replaced by national currency, litas, at the exchange rate of 100 talonas/litas. Projected prices for 1993-95 are expressed in talonas equivalents.

[a]The Lithuanian exchange rate is the commercial rate for July 1993 and actual prices are for May 1993.

[b]The sugar beet to raw sugar ratio is 9.3:1.

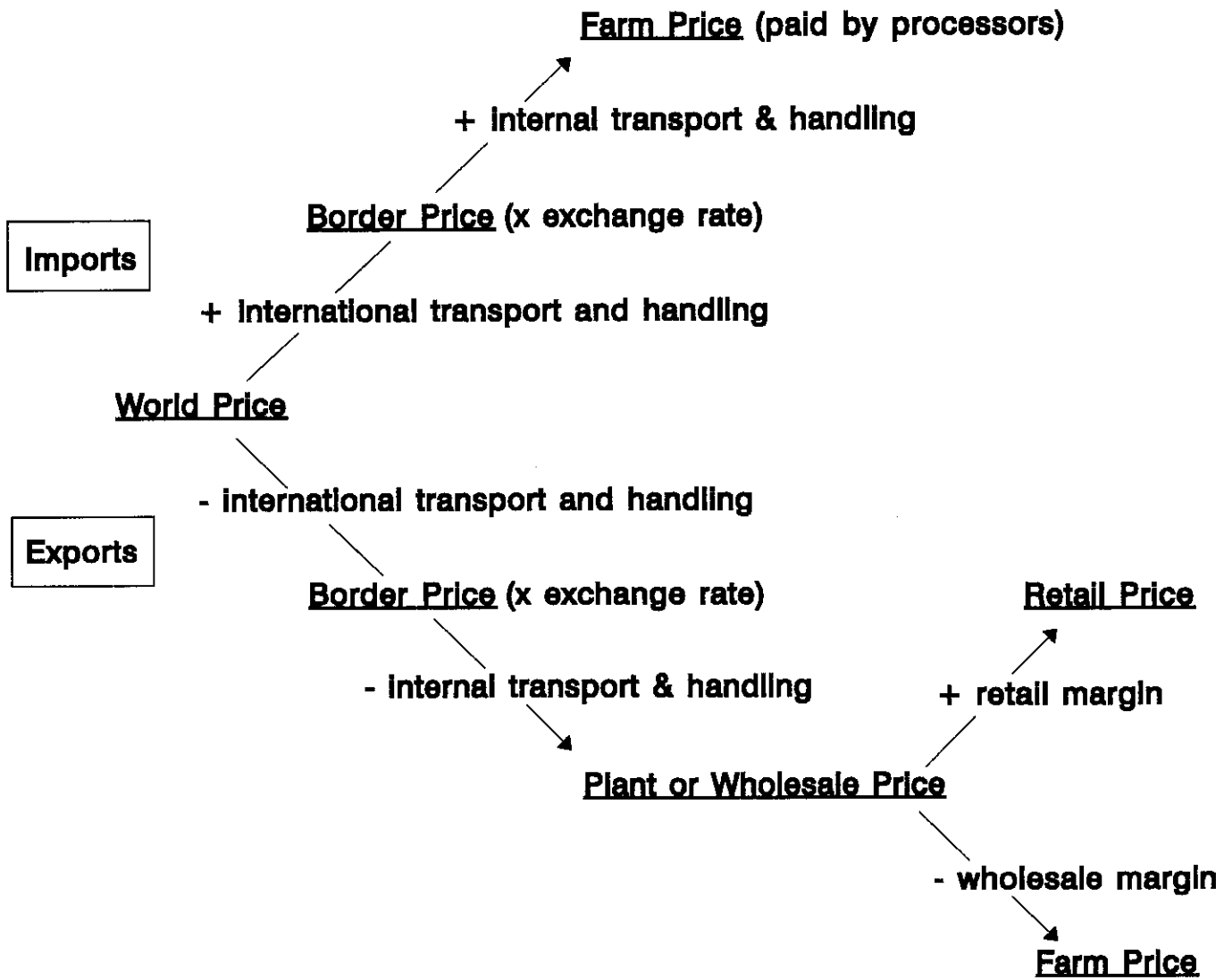

Figure 1.1. Method used to calculate world market parity prices for the domestic market

For exported goods (livestock products), the border price is calculated by subtracting transport and handling costs from the port where the world price is observed. After conversion to domestic currency, the equivalent plant or wholesale price (after processing) is calculated by subtracting the average domestic transport and handling costs from the border to the point where the average wholesale price is measured. In most cases it is the farm or retail prices that are reported in the domestic market, rather than wholesale prices. For meat, butter, and cheese we calculated the equivalent retail price by adding the retail margin to the wholesale world parity price.

Exchange rate assumptions are made for 1993 to 1995, and it is assumed that the Lithuanian currency is currently undervalued by 20 percent. Thus, the real exchange rate appreciates from 25 talonas per U.S. dollar in 1993 to 20 talonas per U.S. dollar in 1995. Estimates of transport and handling costs to the relevant international ports are assumed to be similar to those for Poland. It is difficult to know how reliable these handling costs estimates are, so it should be noted that If they are too high (low), the calculated border price for exports will be too low (high) and for imports will be too high (low). The internal prices would generally be lower (higher) than the border prices for exported (imported) commodities, so domestic transport and handling costs and, where appropriate, retail margins are assumed as well.

The actual domestic farm, wholesale, or retail price is reported for 1991 and 1992; and the comparable free market price is calculated for the same years and projected through 1995. These projections indicate the approximate levels of domestic prices if free trade policies are pursued. To reach world market levels by 1995, real wheat prices would have to increase to 3925 talonas per metric ton, or 139 percent, over three years. Barley prices would only have to increase by 54 percent over the same period. Meat and dairy product prices prices also have very different deviations from world market prices. Beef retail prices would have to rise by 64 percent over three years, chicken meat by 24 percent, and pork prices by only 6.7 percent. Skim milk powder would have to increase by 20 percent over three years, cheddar cheese by 7.6 percent, and butter would have to decline by 46 percent. Sugar, like butter, is already above the world market price in 1992, so it would have to decline. Also the margin between raw sugar and refined sugar is larger than in the world market, so retail sugar prices would have to decline more (31 percent) than the sugar beet farm price (12 percent). It is clear that relative prices would be different under an open market policy than they are currently.

Open Market with Selective Interventions

An open market regime has the advantage of pricing agricultural products at levels that are competitive in the world market and are consistent with economic incentives in other sectors of the Lithuanian economy that have little or no protection from government intervention. However, open markets and free trade also create difficulties for a fledgling market system and for enterprises that are newly privatized or in the process of reorganizing and restructuring. Two major problems are the focus of this section, which reviews the issues and policy response options.

Most products that Lithuania could potentially export must compete in markets where prices are depressed by export subsidies and import barriers of other countries. Likewise, many actual and potential imported products, especially from the European Community, are heavily subsidized. Although Lithuania may be competitive in some of these markets at home and abroad in a world without subsidy, tariff, and nontariff barrier distortions, the existence of these distortions may be a significant burden to enterprises that are in the process of restructuring and adjusting to major changes to the commercial and policy environment. Some methods of protecting the domestic market are compared relative to their distorting effects.

The least distorting method of protecting the domestic market from imports subsidized by other countries is tariffication. This is the mechanism that will most likely be adopted in a new GATT agreement, if and when it is concluded. A policy that seeks to minimize relative price distortions would use the same tariff rate for all imported goods. Under such a policy, the relative prices of these goods at the border would be approximately the same as under open markets but levels of prices would be higher. This would maintain the allocative efficiency of world market price incentives, while providing some protection to domestic enterprises.

A more selective mechanism that is used by some countries, including the United States and Canada, is the countervailing duty. This mechanism sets an import tariff that is equal to the subsidy provided to any particular good from any particular country. Thus, the tariff varies by product and by country of origin, and it increases or decreases with the subsidy of the exporting country. This mechanism may lead to a lower overall protection, but it is more difficult to implement and can be more easily politicized than a fixed tariff rate.

The most distorting means of import protection are variable levies, import licensing, and other quantitative restrictions. These isolate the domestic market from world market influences, are subject to arbitrary decisions by regulators, and encourage rent-seeking behavior among importing firms and regulators involved in import decisions.

Analogous to the import case, the least distorting method of subsidizing exports is through subsidy rates that are the same for all goods. For budgetary reasons, this is probably not a realistic option. If there is a major short-run problem for some commodities in terms of competitiveness in quality, selective and temporary subsidies could be used to partially compensate exporters for quality discounts on export sales. The temporary and partial nature of such subsidies is important so as not to remove the economic incentive for improving the quality competitiveness of these products over time.

As indicated by the data in Table 1.2., the world price of sugar fell by 28 percent in 1991, wheat price increased by about 14 percent the same year, and corn price fell by 14 percent in 1992. These kinds of price fluctuations in the world market are usually caused by weather events and sometimes by policy changes. It is difficult for producers to bear this kind of price risk, and it would be especially difficult for Lithuanian producers during a time when major restructuring is occurring and market mechanisms for price risk insurance (such as futures markets) hardly exist. Stabilization mechanisms can be used to reduce price risk to producers without necessarily deviating in domestic markets from a world market price orientation.

One approach is to focus on reducing the downside price risk to farmers. If the objective is to have an open market policy but avoid sharp declines in farm incomes, a guaranteed price can be established at a level that is normally below the free market price. For example, the guaranteed price could be 85 percent of the moving average of the market price. If the price falls below this level in any year, then the government would guarantee the price by paying farmers the difference between the market price and the guaranteed price. Although this may happen only once in four or five years, it could still be an unplanned shock to the government budget.

A related alternative is to use government purchases and sales to moderate both the upward and downward price fluctuations. In this case, suppose the intervention or buying price for the government is also 85 percent of the moving average of the market price. Then the government would purchase the product as needed to keep the price from falling below this level. Then a sale price of the government-owned stocks would be established; for example, at 115 percent of the moving average price. Obviously, this would only be viable for commodities that can be stored for a year or more. The experience of the United States with this kind of program has been plagued with problems, primarily because the intervention prices were set at arbitrary levels rather than being linked to the market price. Without the mechanism to keep the intervention price below the

average market price, political pressure can cause a creeping escalation of this price floor and lead to unmanageable stock levels and high government costs.

As the market mechanisms and institutions in Lithuania mature, more and more of the price risk can be shifted to the private sector. Private inventory activities and futures and options markets can eventually be used by many enterprises, especially the larger ones, to moderate price risk exposure.

Harmonizing with Expected EC Policies

The decision on whether or not to join the Economic Community is political as well as economic, and the economic considerations and implications go far beyond the food and agricultural sector. Nevertheless, the implications for agriculture and food industries are important, and that is the focus of this discussion.

By the time Lithuania could realistically become a member of the European Community, the CAP will be substantially different from what it has been recently. The CAP reform adopted by the European Community in May 1992 has drastically reduced intervention prices for grains, replacing this support with direct compensation payments that are available to farmers who comply with land set-aside requirements. Beef, butter, and nonfat dry milk intervention prices were reduced by smaller proportions, and poultry and pork prices are expected to decline along with reductions in feed costs. Thus, if Lithuania seeks to harmonize its policies with what the CAP will be, perhaps fifteen or more years from now, analysis of the recent policy reform will provide some indication of what may be expected in the years ahead. A review of the recent CAP reforms will provide a perspective on future directions of EC agricultural policies.

When the CAP reform package was approved in May 1992, Agricultural Commissioner Ray MacSharry emphasized that the reform agreement amounted to the EC's answer to the Dunkel paper on a proposed GATT agreement for agriculture. Whereas the Uruguay Round might have been the force that pushed the CAP reform agreement, a number of other factors aided in dragging it to the brink. Among them were persistent arguments on the efficiency of the CAP. The CAP had been widely viewed as an inefficient income transfer mechanism that penalized European consumers while subsidizing both European producers and food-importing countries. It has also been argued that the CAP, with its artificially high incentives for marginal production, had contributed to inefficient allocation of resources to agriculture. While this system enabled EC producers to raise self-sufficiency levels and improve productivity, it led many producers to ignore market realities and seek to produce quantities well in excess of what the market could absorb (OECD).

Under the CAP, benefits were not equitably distributed. Studies have shown that most of the benefits accrued to wealthier producers. At the same time, efforts to reduce overproduction have affected small-scale producers to the same or a greater extent than large-scale producers. Coresponsibility levies and marketing quotas have penalized small-scale producers by the same amount per unit of production. These revenue reductions often translated into a smaller proportion of profit for the large-scale producer, who could more readily absorb the reductions.

Although the final version of the reform package is not the original MacSharry proposal, it is recognizable as the result of negotiations based on the initial proposal. It has adopted features similar to U.S. farm programs. For example, a compensatory payment is made to producers for production based on historical regional average yields and historical area. This payment is contingent upon idling a certain proportion of historical base area and is meant to bridge the income gap created by the substantial reduction in intervention system support. The intervention system will remain in place, but the floor for domestic prices will be reduced in much the same way as the lower loan rates of the past few years have reduced floor prices for U.S. grains. At the same time, lower grain prices should make EC livestock producers more competitive in world markets and reduce the need for subsidies.

Unlike U.S. deficiency payments, however, compensatory payment levels are not dependent on the difference between the domestic market price and the target price, but are a fixed amount per metric ton. Intervention prices are well above world market prices, in contrast to U.S. loan rates, which are generally well below world prices. Small-scale producers will be exempt from set-aside requirements, and production of crops for nonfood use will be allowed on this set-aside area. Direct payments will be made to some livestock producers, although some of these payments will be for extensification, or reducing the number of animals grazed on a certain area, resulting in lower stocking rates in some areas. Milk marketing quotas will be maintained (or possibly reduced, depending on results of negotiations in the fall of 1992). The general thrust of the CAP reform package is to reduce production while maintaining producer income to the greatest extent possible, particularly for the small-scale producer.

As a result of CAP reform, grains in the European Community are likely to be priced at or near world market prices by 1995 (Table 1.3). Although skim milk powder prices in the Economic Community are projected to approach world market prices by 1995, other meat and dairy products are likely to remain well above world market levels. If there is a GATT agreement during 1993, it is expected that some additional adjustments will be required in the CAP. However, much of what

Table 1.3. World prices compared with EC support prices

	1990	1991	1992	1993	1994	1995
	(U.S.$ per metric ton)					
Wheat						
World, Rotterdam	140	159	166	157	171	188
EC Intervention	210	214	216	154	138	125
Corn						
World, Rotterdam	116	120	103	110	116	123
EC Intervention	210	214	216	154	138	125
Beef						
World, FOB EC Ports	2,150	2,064	2,088	2,058	2,013	1,942
EC Intervention	4,366	4,255	4,461	4,369	4,003	3,677
Pork						
World, FOB EC Ports	1,512	1,362	1,182	1,153	1,323	1,459
EC Basic	2,419	2,357	2,471	2,547	2,464	2,396
Butter						
World, FOB N. Europe	1,363	1,409	1,501	1,536	1,564	1,589
EC Intervention	3,727	3,632	3,807	3,827	3,606	3,508
Skim Milk Powder						
World, FOB N. Europe	1,431	1,681	1,988	1,970	1,971	2,026
EC Intervention	2,195	2,139	2,242	2,312	2,236	2,175

would be required by a new GATT agreement has already benaccomplished in the CAP reform. If additional reductions in subsidized exports of selected commodities are necessary, it is expected that steps would be taken to reduce production rather than further reducing prices.

If Lithuania were to join the European Community after the year 2010, the EC market would very likely be even more integrated with the world market as a result of further internal policy changes and another GATT round. Thus, even a policy trajectory that targets EC membership within the next decade is not one in which high levels of protection for agricultural commodities could be foreseen.

Self-reliance Policy

Self-reliance in the context of Lithuania and other Baltic states usually means that the livestock and dairy industries will be allowed to decrease to the level needed in the domestic market; and the imports of feed ingredients would be minimized by shifting the structure of animal production away from hogs and poultry, which are more dependent on imported feed, toward cattle, which are more dependent on domestically produced forage and feeds. A broader concept of self-

reliance would be to limit the value of imported feed ingredients and food products to not more than the value of exported food and agricultural products. Either one of these options would be difficult to implement without a return to greater government regulation of the market and would lead to significant economic losses compared with the other options. Which kind of loss would occur depends on whether or not the livestock industry can be competitive.

Conclusions

Regardless of the price and trade policies selected for food and agricultural products, a number of other measures will be important. Among these are measures to develop a stable macroeconomic environment and well-functioning financial institutions, to encourage foreign investment capital, to provide a social safety net that reduces tensions associated with employment and price adjustments, and to reduce processing and distribution costs, including privatization of processing, wholesale, and retail enterprises. Adjustments in the food and agricultural sector will be less difficult and the policy constraints less severe, if the general economic environment is more benign. As has often been the case in other countries, policies in other sectors of the economy can be as or more important than policies in the sector itself.

MODELING AGRICULTURAL MARKETS FOR POLICY AND TRADE ANALYSIS IN LITHUANIA

Lithuania, like Estonia and Latvia, has been progressing rapidly in the privatization of agriculture and the development of market economy mechanisms. The initial stage of this transition has focused on the privatization of land and production assets; the establishment of family farms and new management structures for larger farms operated as partnerships; the deregulation of input, farm, and consumer prices, and the liberalization and privatization of trade. Prices and price relationships have been changing rapidly, and for many inputs and some commodities are approaching world market levels. However, it has not yet been decided what is to be the domestic market and foreign trade policy regime that will guide future decisions by government and private decision makers.

It is important at this stage to evaluate the potential consequences of alternative policy choices. These choices are not unique to the food and agriculture sector, but transition reforms have been progressing more rapidly in this sector and a longer run policy framework will lead to more consistent short- and medium-term public policy and private management decisions. This paper presents a modeling framework that can be used to evaluate such policy choices.

Analytical Approach

There are severe limitations to the analysis of food and agricultural markets and policies in transition economies. Nevertheless, it is an important task for several reasons. First, even simple, stylized models will assist analysts in evaluating alternative scenarios and their consequences for production, consumption, trade, and economic performance. Second, analysis of the impacts of various economic reforms and policy alternatives will improve the information base for policymakers. Finally, the process of model development and model-based analysis can be a learning tool for researchers and policy analysts who want to know more about market relationships and behavior.

A model of major agricultural commodity markets in Lithuania is designed to evaluate the possible consequences of alternative policy choices. Three options are specified based on three distinct policy goals that have been part of the policy dialogue:

1. World market pricing and free trade,
2. Harmonizing agricultural policy with EC policies, and
3. Self-reliance strategy for basic foodstuffs.

The analytical problems and the possible approaches vary across the various sub-sectors of the food and agricultural economy, so the model is designed to look separately at such components as production, processing and distribution, demand, and trade. The basic structure of the model is specified as:

$$\text{Supply: } QS = S\,(PF,\ FI,\ S^*,\ T^*), \tag{1}$$

$$\text{Processing and Distribution: } PR = PF + M, \tag{2}$$

$$\text{Demand: } QD = D\,(PR,\ E,\ D^*), \tag{3}$$

$$\text{Trade: } QX = QS - QD - \Delta\, QSTK \tag{4}$$

Endogenous variables for each commodity are defined as follows:

QS is supply;
PF is a vector of farm prices;
PR is a vector of retail prices;
PR is a vector of retail prices;
QD is demand; and
QX is net exports.

Exogenous variables are defined as follows:

PI is input prices;
S^* is structural supply shift;
T^* is technology shift;
M is marketing margin;
E is consumer expenditure or income; and
$\Delta\, QSTK$ is change in stock.

Closure of the model requires price determination and policy assumptions, which are discussed below.

The only estimated parameters available for such a model are the demand elasticities estimated by Shaffer (1993) using household expenditure data from Lithuania. The other behavioral parameters are assumed and are based on previous studies in other countries. Due to the substantial changes in the structure of production and management systems, the supply side is necessarily dominated by assumed growth rates in area and yield, although price elasticities are used to allow for some price response in the policy analysis. The marketing margins between the farm and retail prices also need to be set subjectively on the basis of current information and assumed changes in the future. Stock changes also need to be set as exogenous assumptions.

Specifications of Policies

For each policy option it is necessary to define the price determination and market clearing mechanisms for the model.

World Market Pricing

As a small economy, Lithuania would be a price taker in foreign trade. Thus domestic price determination for tradable goods can be

for imports $PF = PW^*e + IC$, and (5a)

for exports $PF = PW^*e - IC$

where PW is the world price, E is the exchange rate, and IC is the internal transaction cost between the border and the farm. It should be noted that if the transactions costs IC are large, relative prices in the domestic market could be quite different from relative prices in the world market. As with marketing margins, IC may be expected to decline as private markets mature. Nontraded commodities would have prices determined by the domestic supply and demand equilibrium.

Harmonizing with EC Policies

We assume that this policy regime would not adopt current EC prices but rather plan a convergence to EC prices over an extended period of 10 or 15 years. Under the CAP reform adopted in May 1992, with or without a GATT agreement, EC support prices will decline toward world market prices. Some analysts expect the gap between EC and world prices for many commodities to be near zero within 5 to 10 years (FAPRI 1993), but direct payments to farmers initiated in the 1992 reform could continue. To model EC policy mechanisms, we need two additional relationships:

$PF = PFS$, and (5b)

$t = [PF/PW^*e + IC] - 1$, (6)

where PFS is the support price that converges to EC prices, and t is the tariff (variable levy) or subsidy (if negative) rate. In order to be in complete harmony with EC policy, Lithuania would also have to set aside a portion of cropland (probably less than 10 percent), make direct payments to producers, and adopt EC trade regulations. It remains to be seen whether the combination of higher producer prices and lower crop area would result in higher or lower production. Since there would be little difference between this scenario and the world market scenario over the next five years, we have not included this analysis in the paper.

Self-reliance Strategy

Self-reliance in the context of Lithuania and the other Baltic states usually means that the livestock product output will be allowed to decrease to the level needed in the domestic market. The imports of feed ingredients would also be minimized by shifting the structure of animal production away from hogs and poultry, which are more dependent on imported feed, toward cattle, which are more dependent on domestically produced forage and feeds. A broader concept of self-reliance would be to limit the value of imported feed ingredients and food products to not more than the value of exported food and agricultural products. Either one of these concepts would be difficult to implement without a return to greater government regulation of the market. However, the narrow concept of self-reliance is useful to explore as an extreme case, since the analysis may indicate whether it would lead to significant economic losses compared with the other options. To model this option, net exports (equation 4) is set to zero for every commodity and prices are determined by the domestic supply and demand equilibrium, as in the case of autarchy.

Policy Analysis Procedures

To analyze and compare these options, a set of initial conditions and projected levels of exogenous variables must be assumed. The initial conditions include current levels of production, consumption, trade, prices, and income. Projected levels or growth rates are needed for structural and technological shifts in crop area and yield, livestock production, marketing margins, and demand. Projections are also needed for growth rates of real income and real prices that are exogenous to the model. For scenarios one and two, projections on real world prices, real exchange rates, and real transaction costs (IC) are also needed. Using real rather than nominal values for all monetary variables makes the projection task less difficult, since the inflation rate does not require so much attention.

It may appear that the results of the analysis will be almost entirely determined by subjective assumptions. This is primarily true for the baseline or reference scenario. However, by holding most other assumptions constant while changing the policy assumptions, the focus of the analysis will be on the comparison of results in the three scenarios rather than on the absolute levels of any one scenario. Although any of the scenarios could be used as the baseline, our choice was to use a set of real price growth assumptions to generate a baseline.

The real income assumptions for all scenarios are that real income growth declines through 1993, then increases slowly in 1994 and 1995 (Table 2.1). In the baseline real producer prices are

Table 2.1. Aggregate measures in 1990 real values

Indicators	1990	1991	1992	1993	1994	1995
			Assumptions			
Real Per Capita Income (tal.)	2,687	1,320.67	1,101.83	1000	1020	1,060.8
Growth Rate (%)	---	-50.85	-16.57	-9.24	2.00	4.00
Annual Inflation (%)	---	376.20	1,134.20	155.60	42.60	26.00
Nominal Exchange Rate (tal./$[a])	---	110.0	301.9	743.4	925.4	1,000.4
Real Exchange Rate (tal./$)	---	110.0	25.2	25.0	22.5	20.0
			Results			
Food Expenditure Per Capita (tal.)						
Baseline	722.8	778.0	738.4	848.0	860.0	873.8
World Price Scenario				841.3	857.0	871.3
Self-sufficiency Scenario				759.2	766.1	790.6
Growth Rate, %						
Baseline	12.10	7.64	-5.09	14.84	1.41	1.61
World Price Scenario				13.94	1.86	1.67
Self-sufficiency Scenario				2.82	0.91	3.20
Food Expenditure/Income (%)						
Baseline	26.90	58.91	67.02	84.80	84.31	82.37
World Price Scenario				84.13	84.02	82.13
Self-sufficiency Scenario				75.92	75.11	74.53

[a]In 1990 the official exchange rate was 0.58 rubles per U.S. dollar, and the tourist rate was 16.27 rubles per U.S. dollar.

assumed to grow by 2 percent per year up to 10 percent per year depending on the commodity. These assumptions are somewhat arbitrary, but those commodities whose prices grew more rapidly in 1992 and early 1993 are assumed to grow more slowly in the remaining years. The margin between producer and consumer prices is assumed to be similar to what it has been in 1991 and 1992, but these margins are assumed to decline by 5 to 10 percent from 1993 to 1995. This decline in the marketing margin is designed to reflect some improvement in the efficiency of the intermediate sector.

For the world price scenario, implied domestic prices were calculated from border prices and assumed exchange rate levels. The real exchange rate was assumed to be undervalued by 20 percent in 1991 and 1992, so the exchange rate was allowed to appreciate by 20 percent from 1993 to 1995. Domestic prices were assumed to reach world market prices by 1995. To allow for quality differences in meat products, these prices were assumed to reach only 85 percent of world market prices by 1995. For the self-reliance scenario, the extreme case of no trade was assumed.

All imports and exports were reduced to zero by 1995, and the model was solved for equilibrium prices. The scenarios generated by these procedures are then compared with the baseline in terms of production, consumption, trade, and a number of performance aggregates such as prices, consumer expenditures, and value of imports and exports.

Analytical Results

Growth in food expenditures per capita and the percentage of income spent on food are similar in the baseline and world price scenarios (Table 2.1). The biggest increase is between 1992 and 1993, much of which has already occurred. Thereafter, the growth rate of food expenditures is less than the growth rate of income, and the percentage of income spent on food declines slightly. Food expenditure growth and percent of income spent of food is significantly lower under the self-sufficiency scenario, because the prices of exported meat and dairy products decline substantially when trade is reduced to zero.

The level of farm commodity prices in 1995 is compared across scenarios in Table 2.2. Those commodities that were below world market prices in the baseline increased, and those that were above world market prices in the baseline decreased. The biggest increases were in grains and poultry. Beef and milk prices increased slightly, and the prices of other commodities declined. It should be noted that it is very difficult to identify appropriate world market prices for potatoes, vegetables, and eggs, so these results must be viewed with great caution. Another factor that affects relative price changes between meat and grains is that meat is only assumed to reach 85 percent of world market prices because of quality differences. Sugar beet prices are linked to equivalent world market prices of raw cane sugar, which are substantially below domestic market prices in many countries, including Lithuania.

The results of the self-sufficiency scenario are quite extreme. Wheat and sugar prices increase by about 80 percent, since these commodities depend heavily on imports. Commodities that were in surplus in the baseline declined in price. The largest declines were in eggs and milk products, which had the largest proportion of production exported in the baseline. It is obvious that production of milk products, eggs, and perhaps beef and pork would not be sustainable under these price levels. If Lithuania actually desired to pursue this option, there would be far more adjustment in production and perhaps in consumption than the model is able to determine through price effects alone.

Table 2.2. Actual and projected farm prices in Lithuania

Products	1990	1992	1995			World/ Baseline	Selfsuf./ Baseline
			Baseline	World	Selfsuf.		
	(talonas per metric ton[a])					(percent)	
Grains							
Wheat	410.00	420.06	500.30	824.23	887.23	164.75	177.34
Barley	389.50	374.36	397.27	575.60	442.66	144.89	111.43
Potatoes	264.00	454.40	533.58	398.07	533.00	74.60	99.89
Sugar Beets	59.00	135.35	147.90	118.57	273.61	80.17	185.00
Vegetables	420.00	442.49	588.96	387.63	362.93	65.82	61.62
Meat							
Beef	3,001.00	1,269.02	1,689.07	1,770.75	1,361.89	104.84	80.63
Pork	2,855.00	2,321.91	2,464.03	2,436.03	1,968.18	98.86	79.88
Poultry	2,442.00	1,309.27	1,389.41	1,825.94	1,518.52	131.42	109.29
Eggs (1000 units)	93.00	175.91	203.64	171.22	68.96	84.08	33.86
Milk	553.00	346.55	461.26	472.50	16.15	102.44	3.50

Note: Real prices, 1990 = 1.
[a]Rubles per metric ton from 1990 to October 1992.

Table 2.3. Actual and projected production of main agricultural commodities in Lithuania

Products	1990	1992	1995			World/ Baseline	Selfsuf./ Baseline
			Baseline	World	Selfsuf.		
	(thousand metric tons)					(percent)	
Grains	3,261	2,227	3,032	3,327	3,129	109.73	103.22
Wheat	1,175	839	776	851	882	109.75	113.73
Barley	1,192	950	1,626	1,772	1,612	109.03	99.18
Potatoes	1,575	1,080	1,675	1,500	1,657	89.57	98.94
Sugar Beets	9,115	619	1,027	1,008	1,206	98.23	117.48
Vegetables	277	210	373	320	319	85.68	85.45
Meat	530	378	377	378	266	100.15	70.67
Beef	231	230	211	212	124	100.15	58.48
Pork	241	111	128	123	98	96.12	76.53
Poultry	56	33	33	38	36	115.13	106.60
Eggs (1000 units)	1,273	951	1,096	1,014	673	92.49	61.39
Milk	2,160	2,245	2,061	2,048	1,671	99.37	81.10

The comparison of production levels under the different scenarios (Table 2.3) indicates that there is significant adjustment to changes in relative prices of different products. It is clear,

however, that the price elasticities are not large enought to accommodate a huge shock associated with the self-sufficiency scenario.

Consumer prices pretty much follow the changes in producer prices, since the marketing margins are the same in all scenarios (Table 2.4). The changes in per capita consumption of major food products reflect the changes in relative prices (Table 2.5). In the world price scenario, where the price of grains increased significantly relative to potatoes, there is a substantial reduction in grain product consumption and an increase in per capita potato consumption. The biggest increase in per capita consumption in the world price scenario is for sugar, which had a 21 percent retail price decrease. In the self-sufficiency scenario, grain product consumption did not decline very much, since potato prices remained about the same as in the baseline. The per capita consumption of eggs and milk products increased substantially, as these prices fell to very low levels. Sugar consumption, on the other hand, declined by 17 percent as a consequence of an 85 percent rise in sugar prices.

Conclusions

A number of caveats need to be mentioned regarding the results of this analysis. While the impact analysis shows that the modeling framework is very flexible and can be used for a wide range of policy choices, the self-reliance scenario indicates that it is difficult for this model to

Table 2.4. Actual and projected consumer prices in Lithuania

Products	1990	1992	1995			World/ Baseline	Selfsuf./ Baseline
			Baseline	World	Selfsuf.		
	(talonas per kilogram[a])					(percent)	
Grain products	0.18	0.29	0.58	0.95	1.02	164.87	177.39
Potatoes	0.19	0.51	0.80	0.60	0.80	75.00	99.88
Vegetables	0.63	0.41	1.06	0.70	0.65	65.75	61.60
Meat Products							
Beef	2.02	3.90	4.73	4.96	3.81	104.88	80.57
Pork	2.26	5.05	4.93	4.87	3.94	98.82	79.95
Poultry	3.15	4.14	3.20	4.20	3.49	131.46	109.23
Eggs (10 units)	1.40	1.94	2.65	2.23	0.90	84.15	33.83
Milk products	0.23	0.49	0.65	0.66	0.23	101.54	34.78
Sugar	0.79	2.69	2.66	2.09	4.93	78.51	185.20

Note: Real prices, 1990 = 1.
[a]Rubles per kilogram from 1990 to October 1992.

Table 2.5. Actual and projected per capita consumption of main food products in Lithuania

Products	1990	1992	1995			World/ Baseline	Selfsuf./ Baseline
			Baseline	World	Selfsuf.		
	(kilograms)						
Grain Products	183.4	168.2	157.1	136.9	154.1	87.15	98.09
Potatoes	146.0	78.0	80.5	84.3	76.7	104.61	95.18
Vegetables	79.0	80.0	64.2	71.2	73.8	110.80	114.87
Meat Products	89.0	58.0	57.4	56.9	59.6	99.27	103.84
Beef	36.9	24.2	22.9	22.9	24.8	100.17	108.22
Pork	34.1	21.7	21.6	21.8	23.5	101.21	108.81
Poultry	13.3	9.2	9.9	9.3	9.2	93.54	93.33
Eggs (units)	304.0	160.0	157.1	159.8	175.0	101.75	111.43
Milk Products	476.0	280.0	270.7	269.9	391.3	99.73	144.59
Sugar	43.2	37.5	37.2	40.0	30.9	107.55	83.13

provide realistic results when there is a large policy shock. There are two possible ways to remedy this. One is to increase the price elasticities for livestock products, so that demand and supply adjust more when prices change. Unfortunately, data are not yet available to estimate these parameters by statistical means. Another approach would be to use group expenditures for crop and livestock products as the income variable in crop and livestock demand equations. Then the expenditure shares could be allowed to adjust to changing relative prices of crop and livestock products, providing greater substitution effects between these two food groups.

The world price scenario is subject to many assumptions about the evolution of exchange rates and the international and domestic handling costs, which are very uncertain. As some of this information becomes available, better assumptions can be made. The impact of the world price scenario is also highly dependent on the supply, demand, and prices in the baseline. We allowed the real prices of commodities to rise in the baseline assumptions, because the real prices of these commodities have been flat or have declined since 1990, while real input prices have increased and are near world market prices. Of course, if we continued constant real prices in the baseline, the impacts of the world price scenario would be larger.

Despite these caveats, the analysis provides useful insights into the implications of alternative policy choices. First, the "free trade" scenario does not raise the percentage of income spent on food much above where it already is in early 1993, although relative prices change significantly. Second, the self-sufficiency scenario shows the difficulty and the costs associated with

such a policy. Both the baseline and world price scenarios project a significant and positive trade balance among these commodities. This is lost in the self-sufficiency option, and the extreme decline in prices of many livestock products indicates that another major liquidation of animals would have to occur. Such economic losses would be very difficult for the Lithuanian economy to bear and would further disrupt the agricultural production and processing industry.

APPENDIX A.
INITIAL CALCULATION OF FREE TRADE PRICES FOR LITHUANIA, 1991-95

Table A.1. Free trade prices for Lithuania compared with actual domestic and projected prices in real 1991 U.S. dollars or talonas per metric ton

	1991	1992	1993[a]	1994	1995
Real Exchange Rate (tl./U.S.$)	110	25.2	25	22.5	20
CPI Lithuania (1991 = 1)	1	12.342	31.546	44.985	56.681
CPI U.S. (1991 = 1)	1	1.030	1.061	1.094	1.133
Exchange Rate (tl/U.S.$)[b]	110	301.9	743.4	925.4	1,000.4
Inflation Lithuania	376.2	1,134.2	155.6	42.6	26.0
Inflation U.S.	4.2	3.0	3.0	3.1	3.6
Wheat			(U.S.$ per metric ton)		
Importer					
World Price, Rot.	159	166	157	171	188
Real World Price	159.0	161.2	148.0	156.3	165.9
Handling	12.5	12.5	12.5	12.5	12.5
Border Price	171.5	173.7	160.5	168.8	178.4
			(talonas per metric ton)		
Border Price	18,865	4,375	4,012	3,799	3,568
Domestic Handling	1,887	438	401	380	357
Farm Price (world)	20,752	4,813	4,413	4,179	3,925
Farm Price (actual)	1,000	1,645	2,120	2,248	2,382
Corn			(U.S. $ per metric ton)		
Importer					
World Price, Rot.	120	103	110	116	123
Real World Price	120.0	100.0	103.7	106.1	108.5
Handling	10.0	10.0	10.0	10.0	10.0
Border Price	130.0	110.0	113.7	116.1	118.5
			(talonas per metric ton)		
Border Price	14,300	2,771	2,842	2,611	2,371
Domestic Handling	1,430	277	284	261	237
Farm Price (world)	15,730	3,049	3,126	2,872	2,608
Barley			(U.S.$ per metric ton)		
Importer					
World Price, Rot.	122	120	119	119	127
Real World Price	122.0	116.5	112.2	108.8	112.1
Handling	12.5	12.5	12.5	12.5	12.5
Border Price	134.5	129.0	124.7	121.3	124.6
			(talonas per metric ton)		
Border Price	14,795	3,250	3,117	2,729	2,492
Domestic Handling	1,480	325	312	273	249
Farm Price (world)	16,275	3,575	3,428	3,002	2,741
Farm Price (actual)	900	1,783	1,818	1,855	1,892

Table A.1. continued

	1991	1992	1993	1994	1995
Beef			(U.S.$ per metric ton)		
Exporter					
World Price, N. Eur.	1,990	2,018	1,987	1,912	1,853
Real World Price	1,990.0	1,959.2	1,872.9	1,748.1	1,635.2
Handling	25.0	25.0	25.0	25.0	25.0
Border Price	1,965.0	1,934.2	1,847.9	1,723.1	1,610.2
			(talonas per metric ton)		
Border Price	216,150	48,733	46,198	38,769	32,205
Domestic Handling	54,038	12,183	11,550	9,692	8,051
Wholesale Price	162,113	36,550	34,649	29,077	24,154
Retail Margin	24,317	5,482	5,197	4,361	3,623
Retail Price (world)	186,429	42,032	39,846	33,438	27,777
Retail Price (actual)	18,660	16,975	19,942	21,205	22,521
Pork			(U.S.$ per metric ton)		
Exporter					
World Price, N. Eur.	1,370	1,189	1,124	1,264	1,426
Real World Price	1,370.0	1,154.4	1,059.5	1,155.6	1,258.4
Handling	35.0	35.0	35.0	35.0	35.0
Border Price	1,335.0	1,119.4	1,024.5	1,120.6	1,223.4
			(talonas per metric ton)		
Border Price	146,850	28,203	25,612	25,214	24,468
Domestic Handling	4,406	846	768	756	734
Wholesale Price	142,445	27,356	24,844	24,457	23,734
Retail Margin	21,367	4,103	3,727	3,669	3,560
Retail Price (world)	163,811	31,460	28,570	28,126	27,295
Retail Price (actual)	18,230	25,572	24,812	24,158	23,467
Chicken			(U. S.$ per metric ton)		
Exporter					
World Price	1,162	1,175	1,169	1,215	1,229
Real World Price	1,162.0	1,140.8	1,101.9	1,110.8	1,084.6
Handling	30.0	30.0	30.0	30.0	30.0
Border Price	1,132.0	1,110.8	1,071.9	1,080.8	1,054.6
			(talonas per metric ton)		
Border Price	124,520	27,986	26,797	24,318	21,091
Domestic Handling	3,736	840	804	730	633
Wholesale Price	120,784	27,146	25,993	23,589	20,459
Retail Margin	18,118	4,072	3,899	3,538	3,069
Retail Price (world)	138,902	31,218	29,892	27,127	23,528
Retail Price (actual)	19,190	18,191	15,899	15,568	15,218

Table A.1. continued

	1991	1992	1993	1994	1995
Butter			(U.S.$ per metric ton)		
Exporter					
World Price	1,409	1,501	1,536	1,564	1,589
Real World Price	1,409.0	1,457.3	1,447.8	1,429.9	1,402.3
Handling	75.0	75.0	75.0	75.0	75.0
Border Price	1,334.0	1,382.3	1,372.8	1,354.9	1,327.3
			(talonas per metric ton)		
Border Price	146,740	34,827	34,321	30,485	26,545
Domestic Handling	36,685	8,707	8,580	7,621	6,636
Wholesale Price	110,055	26,120	25,741	22,864	19,909
Retail Margin	14,307	3,396	3,346	2,972	2,588
Retail Price (world)	124,362	29,516	29,087	25,836	22,497
Milk Farm Price (act.)	800	1,650	1,815	1,997	2,197
Marketing Margin	18,230	35,065	25,414	22,964	19,769
Retail Price (act.)	19,030	36,715	27,230	24,961	21,965
Skim milk powder			(U.S.$ per metric ton)		
Exporter					
World Price	1,376	1,681	1,988	1,970	1,971
Real World Price	1,376.0	1,632.0	1,873.9	1,801.1	1,739.4
Handling	350.0	350.0	350.0	350.0	350.0
Border Price	1,026	1,282.0	1,523.9	1,451.1	1,389.4
			(talonas per metric ton)		
Border Price	112,860	32,301	38,907	32,649	27,788
Domestic Handling	28,215	8,075	9,524	8,162	6,947
Wholesale Price (world)	84,645	24,226	28,573	24,487	20,841
Milk Farm Price (act.)	800	1,650	1,815	1,997	2,197
Processing Margin	7,600	15,678	17,243	18,972	20,872
Wholesale Price (act.)	8,400	17,328	19,058	20,969	23,069
Cheddar Cheese			(U.S.$ per metric ton)		
Exporter					
World Price	1,733	2,007	1,934	1,538	1,623
Real World Price	1,733.0	1,948.5	1,823.0	1,406.1	1,432.3
Handling	100.0	100.0	100.0	100.0	100.0
Border Price	1,633.0	1,848.5	1,723.0	1,306.1	1,332.3
			(talonas per metric ton)		
Border Price	179,630	46,574	43,075	29,388	26,645
Domestic Handling	44,908	11,644	10,769	7,347	6,661
Wholesale Price (world)	134,723	34,931	32,306	22,041	19,984
Retail Margin	17,514	4,541	4,200	2,865	2,598
Retail Price (world)	152,236	39,472	36,506	24,906	22,582
Milk Farm Price (act.)	800	1,650	1,815	1,997	2,197
Marketing Margin	21,648	24,878	27,230	27,956	28,555
Retail Price (act.)	22,448	26,528	29,045	29,953	30,751

Table A.1. continued

	1991	1992	1993	1994	1995
Refined Sugar			(U.S.$ per metric ton)		
Importer					
World Price	273	276	283	303	350
Real World Price	273.0	268.0	266.8	277.0	308.9
Handling	15.0	15.0	15.0	15.0	15.0
Border Price	288.0	283.0	281.8	292.0	323.9
			(talonas per metric ton)		
Border Price	31,680	7,129	7,044	6,570	6,477
Domestic Handling	4,435	998	986	920	907
Wholesale Price (world)	36,115	8,127	8,030	7,490	7,384
Retail Margin	7,223	1,625	1,606	1,498	1,477
Retail Price (world)	43,338	9,753	9,636	8,988	8,861
Retail Price (actual)	7,286	12,792	13,277	12,992	12,677
Raw Cane Sugar			(U.S.$ per metric ton)		
Importer					
World Price	198	200	210	210	244
Real World Price	198.0	194.2	197.9	192.0	215.3
Handling	15.0	15.0	15.0	15.0	15.0
Border Price	213.0	209.2	212.9	207.0	230.3
			(talonas per metric ton)		
Border Price	23,430	5,270	5,324	4,657	4,607
Domestic Handling	3,280	738	745	652	645
Price at Plant (world)	26,710	6,008	6,069	5,309	5,251
Raw Beet Sugar[c]					
Beet Equiv. Price (world)	2,872	646	753	571	565
Beet Farm Price (act.)	350	645	664	684	704

Notes: World prices are linked to FAPRI projections, except for sugar, which is linked to World Bank projections. Domestic prices are in rubles per metric ton for 1991 and in talonas per metric ton since October 1992. Since June 1993, talonas was replaced by national currency, litas, at the exchange rate of 100 talonas per litas. Projected prices for 1993-95 are expressed in talonas equivalents.

[a]The Lithuanian exchange rate is the commercial rate for July 1993 and actual prices are for May 1993.

[b]For 1993 to 1995, the exchange rate is litas per U.S.$100.

[c]The sugar beet to raw sugar ratio is 9.3:1.

APPENDIX B.
RECALCULATED FREE TRADE PRICES IN REAL AND NOMINAL EXCHANGE RATES, 1991-95

Table B.1. Recalculated free trade prices for Lithuania in real 1991 U.S. dollars or talonas per metric ton

	1991	1992	1993[a]	1994	1995
Real Exchange Rate (tl./U.S.$)	110	25.2	11.1	10	10
CPI Lithuania (1991 = 1)	1	12.342	31.546	44.985	56.681
CPI U.S. (1991 = 1)	1	1.030	1.061	1.094	1.133
Exchange Rate (tl/U.S.$)[b]	110	301.9	330.0	411.3	500.2
Inflation Lithuania	376.2	1,134.2	155.6	42.6	26.0
Inflation U.S.	4.2	3.0	3.0	3.1	3.6
Wheat			(U.S.$ per metric ton)		
Importer					
World Price, Rot.	159	166	157	171	188
Real World Price	159.0	161.2	148.0	156.3	165.9
Handling	12.5	12.5	12.5	12.5	12.5
Border Price	171.5	173.7	160.5	168.8	178.4
			(talonas per metric ton)		
Border Price	18,865	4,375	1,781	1,688	1,784
Domestic Handling	1,887	438	178	169	178
Farm Price (world)	20,752	4,813	1,959	1.857	1,962
Farm Price (actual)	1,000	1,645	1,348		
Percent of World	4.8	34.2	68.8		
Corn			(U.S. $ per metric ton)		
Importer					
World Price, Rot.	120	103	110	116	123
Real World Price	120.0	100.0	103.7	106.1	108.5
Handling	10.0	10.0	10.0	10.0	10.0
Border Price	130.0	110.0	113.7	116.1	118.5
			(talonas per metric ton)		
Border Price	14,300	2,771	1,262	1,161	1,185
Domestic Handling	1,430	277	126	116	119
Farm Price (world)	15,730	3,049	1,388	1,277	1,304
Barley			(U.S.$ per metric ton)		
Importer					
World Price, Rot.	122	120	119	119	127
Real World Price	122.0	116.5	112.2	108.8	112.1
Handling	12.5	12.5	12.5	12.5	12.5
Border Price	134.5	129.0	124.7	121.3	124.6
			(talonas per metric ton)		
Border Price	14,795	3,250	1,384	1,213	1,246
Domestic Handling	1,480	325	138	121	125
Farm Price (world)	16,275	3,575	1,522	1.334	1,370
Farm Price (actual)	900	1,783	1.229		
Percent of World	5.5	49.9	80.7		

Table B.1. continued

	1991	1992	1993	1994	1995
Beef			(U.S.$ per metric ton)		
Exporter					
World Price, N. Eur.	1,990	2,018	1,987	1,912	1,853
Real World Price	1,990.0	1,959.2	1,872.9	1,748.1	1,635.2
Handling	25.0	25.0	25.0	25.0	25.0
Border Price	1,965.0	1,934.2	1,847.9	1,723.1	1,610.2
			(talonas per metric ton)		
Border Price	216,150	48,733	20,508	17,231	16,102
Domestic Handling	54,038	12,183	5,127	4,308	4,026
Wholesale Price	162,113	36,550	15.381	12,923	12,077
Retail Margin	24,317	5,482	2,307	1,938	1,812
Retail Price (world)	186,429	42,032	17,688	14,861	13,888
Retail Price (actual)	18,660	16,975	20,524		
Percent of World	10.0	40.4	116.0		
Pork			(U.S.$ per metric ton)		
Exporter					
World Price, N. Eur.	1,370	1,189	1,124	1,264	1,426
Real World Price	1,370.0	1,154.4	1,059.5	1,155.6	1,258.4
Handling	35.0	35.0	35.0	35.0	35.0
Border Price	1,335.0	1,119.4	1,024.5	1,120.6	1,223.4
			(talonas per metric ton)		
Border Price	146,850	28,203	11,370	11,206	12,234
Domestic Handling	4,406	846	341	336	367
Wholesale Price	142,445	27,356	11,029	10,870	11,867
Retail Margin	21,367	4,103	1,654	1,630	1,780
Retail Price (world)	163,811	31,460	12,683	12,500	13,647
Retail Price (actual)	18,230	25,572	23,572		
Percent of World	11.1	81.3	185.9		
Chicken			(U. S.$ per metric ton)		
Exporter					
World Price	1,162	1,175	1,169	1,215	1,229
Real World Price	1,162.0	1,140.8	1,101.9	1,110.8	1,084.6
Handling	30.0	30.0	30.0	30.0	30.0
Border Price	1,132.0	1,110.8	1,071.9	1,080.8	1,054.6
			(talonas per metric ton)		
Border Price	124,520	27,986	11,896	10,808	10,546
Domestic Handling	3,736	840	357	324	316
Wholesale Price	120,784	27,146	11,539	10,484	10,229
Retail Margin	18,118	4,072	1,731	1,573	1,534
Retail Price (world)	138,902	31,218	13,270	12,507	11.764
Retail Price (actual)	19,190	18,191	19,810		
Percent of World	13.8	58.3	149.3		

Table B.1. continued

	1991	1992	1993	1994	1995
Butter			(U.S.$ per metric ton)		
Exporter					
World Price	1,409	1,501	1,536	1,564	1,589
Real World Price	1,409.0	1,457.3	1,447.8	1,429.9	1,402.3
Handling	75.0	75.0	75.0	75.0	75.0
Border Price	1,334.0	1,382.3	1,372.8	1,354.9	1,327.3
			(talonas per metric ton)		
Border Price	146,740	34,827	15,236	13,549	13,273
Domestic Handling	36,685	8,707	3,809	3,387	3,318
Wholesale Price	110,055	26,120	11,427	10,162	9,955
Retail Margin	14,307	3,396	1,485	1,321	1,294
Retail Price (world)	124,362	29,516	12,912	11,483	11,249
Milk Farm Price (act.)	800	1,650	1,276		
Marketing Margin	18,230	35,065	27,117		
Retail Price (act.)	19,030	36,715	28,393		
Percent of World	15.3	124.4	219.9		
Skim milk powder			(U.S.$ per metric ton)		
Exporter					
World Price	1,376	1,681	1,988	1,970	1,971
Real World Price	1,376.0	1,632.0	1,873.9	1,801.1	1,739.4
Handling	350.0	350.0	350.0	350.0	350.0
Border Price	1,026	1,282.0	1,523.9	1,451.1	1,389.4
			(talonas per metric ton)		
Border Price	112,860	32,301	16,912	14,511	13,894
Domestic Handling	28,215	8,075	4,228	3,628	3,473
Wholesale Price (world)	84,645	24,226	12,684	10,883	10,420
Milk Farm Price (act.)	800	1,650	1,276		
Processing Margin	7,600	15,678	12,124		
Wholesale Price (act.)	8,400	17,328	13,400		
Percent of World	9.9	71.5	105.6		
Cheddar Cheese			(U.S.$ per metric ton)		
Exporter					
World Price	1,733	2,007	1,934	1,538	1,623
Real World Price	1,733.0	1,948.5	1,823.0	1,406.1	1,432.3
Handling	100.0	100.0	100.0	100.0	100.0
Border Price	1,633.0	1,848.5	1,723.0	1,306.1	1,332.3
			(talonas per metric ton)		
Border Price	179,630	46,574	19,122	13,061	13,323
Domestic Handling	44,908	11,644	4,780	3,265	3,331
Wholesale Price (world)	134,723	34,931	14,341	9,796	9,992
Retail Margin	17,514	4,541	1,864	1,273	1,299
Retail Price (world)	152,236	39,472	16,206	11,069	11,291
Milk Farm Price (act.)	800	1,650	1,276		
Marketing Margin	21,648	24,878	19,239		
Retail Price (act.)	22,448	26,528	20,515		
Percent of World	14.7	67.2	126.6		

Table B.1. continued

	1991	1992	1993	1994	1995
Refined Sugar			(U.S.$ per metric ton)		
Importer					
World Price	273	276	283	303	350
Real World Price	273.0	268.0	266.8	277.0	308.9
Handling	15.0	15.0	15.0	15.0	15.0
Border Price	288.0	283.0	281.8	292.0	323.9
			(talonas per metric ton)		
Border Price	31,680	7,129	3,127	2,920	3,239
Domestic Handling	4,435	998	438	409	453
Wholesale Price (world)	36,115	8,127	3,565	33,29	3,692
Retail Margin	7,223	1,625	713	666	738
Retail Price (world)	43,338	9,753	4,278	3,995	4431
Retail Price (actual)	7,286	12,792	9,476		
Percent of World	16.8	131.2	221.5		
Raw Cane Sugar			(U.S.$ per metric ton)		
Importer					
World Price	198	200	210	210	244
Real World Price	198.0	194.2	197.9	192.0	215.3
Handling	15.0	15.0	15.0	15.0	15.0
Border Price	213.0	209.2	212.9	207.0	230.3
			(talonas per metric ton)		
Border Price	23,430	5,270	2,363	2,070	2,303
Domestic Handling	3,280	738	331	290	322
Price at Plant (world)	26,710	6,008	2,694	2,360	2,626
Raw Beet Sugar[c]					
Beet Equiv. Price (world)	2,872	646	290	254	282
Beet Farm Price (act.)	350	645	229		
Percent of World	1.2	99.8	78.9		

Notes: World prices are linked to FAPRI projections, except for sugar, which is linked to World Bank projections. Domestic prices are in rubles per metric ton for 1991 and in talonas per metric ton since October 1992. Since June 1993, talonas was replaced by national currency, litas, at the exchange rate of 100 talonas per litas. Projected prices for 1993-95 are expressed in talonas equivalents.

[a]The Lithuanian exchange rate is the commercial rate for July 1993 and actual prices are for May 1993.

[b]For 1993 to 1995, the exchange rate is litas/R.S. $100.

[c]The sugar beet to raw sugar ratio is 9.3:1.

Table B.2. Recalcuated free trade prices for Lithuania in nominal terms

	1991	1992	1993[a]	1994	1995
Real Exchange Rate (tl/US$)	110	25.2	11.1	10	10
CPI Lithuania (1991=1)	1	12.342	31.472	44.879	56.548
CPI U.S. (1991-1)	1	1.030	1.061	1.094	1.113
Exchange rate (tl/US$)[b]	110	301.9	330.0	410.3	499.0
Inflation Lithuania (%)	376.2	1,134.3	155.0	42.6	26.0
Inflation U.S. (%)	4.2	3.0	3.0	3.1	3.6
Wheat			(U.S.$ per metric ton)		
Importer					
World Price, Rot.	159	166	157	171	188
Handling	12.5	12.5	12.5	12.5	12.5
Border Price	171.5	178.5	169.5	183.5	200.5
			(talonas per metric ton)		
Border Price	18,865	53,889	55,935	75,292	100,055
Domestic Handling	1,887	5,389	5,594	7,529	10,005
Farm Price (world)	20,752	59,278	61,529	82,821	110,060
Farm Price (actual)	1,000	20,305	35,000		
Corn			(U.S.$ per metric ton)		
Importer					
World Price, Rot.	120	103	110	116	123
Handling	10.0	10.0	10.0	10.0	10.0
Border Price	130.0	113.0	120.0	126.0	133.0
			(talonas per metric ton)		
Border Price	14,300	34,115	39,600	51,699	66,370
Domestic Handling	1,430	3,411	3,960	5,170	6,637
Farm Price (world)	15,730	37,526	43,560	56,869	73,007
Barley			(U.S.$ per metric ton)		
Importer					
World Price, Rot.	122	120	119	119	127
Handling	12.5	12.5	12.5	12.5	12.5
Border Price	134.5	132.5	131.5	131.5	139.5
			(talonas per metric ton)		
Border price	14,795	40,002	43,395	53,956	69,614
Domestic Handling	1,480	4,000	4,340	5,396	6,961
Farm Price (world)	16,275	44,002	47,735	59,351	76,575
Farm Price (actual)	900	22,002	32,000		

Table B.2. continued

	1991	1992	1993	1994	1995
Beef			(U.S.$ per metric ton)		
Exporter					
World Price, N. Eur.	1,990	2,018	1,987	1,912	1,853
Handling	25.0	25.0	25.0	25.0	25.0
Border Price	1,965.0	1,993.0	1,962.0	1,887.0	1,828.0
			(talonas per metric ton)		
Border Price	216,150	601,687	647,460	774,225	912,219
domestic Handling	54,038	150,422	161,865	193,564	228,055
Wholesale Price	162,113	451,265	485,595	580,691	684,164
Live/Slaughter Price	0.5	0.5	0.5	0.5	0.5
Farm Price (world)	81,056	225,633	242,798	290,346	342,082
Farm Price (actual)	6,698	58,000	240,000		
Pork			(U.S.$ per metric ton)		
Exporter					
World Price, N. Eur.	1,370	1,189	1,124	1,264	1,426
Handling	35.0	35.0	35.0	35.0	35.0
Border Price	1,335.0	1,154.0	1,089.0	1,229.0	1,391.0
			(talonas per metric ton)		
Border Price	146,850	348,393	359,370	504,271	694,145
Domestic Handling	4,406	10,452	10,781	15,128	20,824
Wholesale Price	142,445	337,941	348,589	489,143	673,320
Live/Slaughter Price	0.6	0.6	0.6	0.6	0.6
Farm Price (world)	85,467	202,764	209,153	293,486	403,992
Farm Price (actual)	6,644	140,000	320,000		
Importer			(U.S.$ per metric ton)		
World Price, N. Eur.	1,370	1,189	1,124	1,264	1,426
Handling	35.0	35.0	35.0	35.0	35.0
Border Price	1,405	1,224	1,159	1,299	1,461
			(talonas per metric ton)		
Border Price	154,550	369,526	382,470	532,993	729,076
Domestic Handling	4,637	11,086	11,474	15,990	21,872
Wholesale Price	159,187	380,611	393,944	548,983	750,949
Live/Slaughter Price	0.6	0.6	0.6	0.6	0.6
Farm Price (world)	95,512	228,367	236,366	329,390	450,569
Farm Price (actual)	6,644	140,000	320,000		

Table B.2. Continued

	1991	1992	1993	1994	1995
Chicken			(U.S.$ per metric ton)		
Exporter					
World Price	1,162	1,175	1,169	1,215	1,229
Handling	30.0	30.0	30.0	30.0	30.0
Border Price	1,132.0	1,145.0	1,139.0	1,185.0	1,199.0
			(talonas per metric ton)		
Border Price	124,520	345,676	375,870	486,217	598,332
Domestic Handling	3,736	10,370	11,276	14,587	17,950
Wholesale Price	120,784	335,305	364,594	471,631	580,382
Retail Margin	18,118	50,296	54,689	70,745	87,057
Retail Price (world)	138,902	385,601	419,283	542,375	667,439
Retail Price (actual)	19,190	224,511	515,000		
Butter			(U.S.$ per metric ton)		
Exporter					
World Price	1,409	1,501	1,536	1,564	1,589
Handling	75.0	67.0	75.0	75.0	75.0
Border Price	1,334.0	1,426.0	1,461.0	1,489.0	1,514,0
Border Price	146,740	430,509	482,130	610,952	755,525
Domestic Handling	36,685	107,627	120,533	152,738	188,881
Wholesale Price	110,055	322,882	361,598	458,214	566,644
Retail Margin	14,307	41,975	47,008	59,568	73,664
Retail Price (world)	124,362	364,857	408,605	517,78	640,307
Milk Farm Price (actual)	800	20,000	33,200		
Marketing Margin	18,230	424,960	464,800		
Retail Price (actual)	19,030	444,960	498,000		
Skim Milk Powder			(U.S.$ per metric ton)		
Exporter					
World Price	1,376	1,681	1,988	1,970	1,971
Handling	350.0	350.0	350.0	350.0	350.0
Border Price	1,026.01	1,331.0	1,638.0	1,620.0	1,621.0
			(talonas per metric ton)		
Border Price	112,860	401,829	540,540	664,702	808,921
Domestic Handling	28,215	100,457	135,135	166,176	202,230
Wholesale Price (world)	84,645	301,372	405,405	498,527	606,690
Milk Farm Price (actual)	800	20,000	33,000		
Processing Margin	7,600	190,000	313,500		
Wholesale Price (actual)	8,400	210,000	346,500		

Table B.2. continued

	1991	1992	1993	1994	1995
Cheddar Cheese			(U.S.$ per metric ton)		
Exporter					
World Price	1,733	2,007	1,934	1,538	1,623
Handling	100.0	100.0	100.0	100.0	100.0
Border Price	1,633.0	1,907.0	1,834.0	1,438.0	1,523.0
			(talonas per metric ton)		
Border Price	179,630	575,723	605,220	590,026	760,016
Domestic Handling	44,908	143,931	151,305	147,506	190,004
Wholesale Price (world)	134,723	431,792	453,915	442,519	570,012
Retail Margin	17,514	56,133	59,009	57,528	74,102
Retail Price (world)	152,236	487,925	512,924	500,047	644,114
Milk Farm Price (actual)	800	20,000	33,200		
Marketing Margin	21,648	301,500	498,000		
Retail Price (actual)	22,448	321,500	531,200		
Refined Sugar			(U.S.$ per metric ton)		
Importer					
World Price	273	276	283	303	350
Handling	15.0	15.0	15.0	15.0	15.0
Border Price	288.0	291.0	298.0	318.0	365
			(talonas per metric ton)		
Border Price	31,680	87,853	98,340	130,479	182,144
Domestic Handling	4,435	12,299	13,768	18,267	25,500
Wholesale Price (world)	36,115	100,152	112,108	148,746	107,645
Retail Margin	7,223	20,030	22,422	29,749	41,529
Retail Price (world)	43,338	120,183	134,529	178,495	249,173
Retail Price (actual)	7,290	114,000	247,000		
Raw Cane Sugar			(U.S.$ per metric ton)		
Importer					
World Price	198	200	210	120	244
Handling	15.0	15.0	15.0	15.0	15.0
Border Price	213.0	215.0	225.0	225.0	259.0
			(talonas per metric ton)		
Border Price	23,430	64,909	74,250	92,320	129,248
Domestic Handling	3,280	9,087	10,395	12,925	18,095
Price at Plant (world)	26,710	73,996	84,645	105,245	147,342
Raw Beet Sugar[c]	2,872	7,957	9,102	11,317	15,843
Beet Equiv. Price (world)	350	6,000	6,000		
Beet Farm Price (actual)					

Notes: World prices are linked to FAPRI projections, except for sugar, which is linked to World Bank projections. Domestic prices are in rubles per metric ton for 1991 and in talonas per metric ton since October 1992. Since June 1993, talonas was replaced by national currency, litas, at the exchange rate of 100 talonas per litas. Projected prices for 1993-1995 are expressed in talonas equivalents.

[a]The Lithuanian exchange rate is the commercial rate for July 1993 and actual prices are for May 1993.

[b]For 1993 to 1995, the exchange rate is litas per U.S.$100.

[c]The sugar beet to raw sugar ratio is 9.3:1.

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